

(19) **FEDERAL REPUBLIC OF GERMANY**
GERMAN [Crest] PATENT OFFICE

(12) **UTILITY PATENT** **U1**

(11) Register No. **G 94 14 868.6**

(51) Main class **A61K 49/04**

Subclass(es) **A61L 31/00**

(22) Filing date **September 13, 1994**

(47) Registration date **December 15, 1994**

(43) Publication in the
Official Gazette **February 2, 1995**

(54) Title of invention **Particles for vascular embolization**

(73) Name and domicile of proprietor
**Klein, Hans-Martin, Dr.med., 52074 Aachen, DE; Günther,
Rolf W., Prof. Dr.med., 52074 Aachen, DE**

LBE **Interest in licensing declared nonbindingly**

Title: Radiodense Embolise Particles

Description:

Vascular defects can lead to blood loss or improper blood distribution, with impairment of oxygen supply. These defects can be occluded, "embolized," by the placement of wire coils, tissue adhesives, balloons and synthetic particles.

To this end, after puncture of a vessel, usually in the inguinal region, a catheter is placed immediately before the vascular defect. Through it embolise is injected, resulting in the occlusion of the vascular defect. A very important factor in the success of embolization is localization of the embolise by visualization on the radioscopic image. Correct placement is imperative to ensure the success of the procedure; improper placement can result in injury.

Solid bodies such as metal coils are usually radiodense. Adhesives such as histoacrylic, for example, are made radiodense by being mixed with contrast agent (e.g. lipiodol). The synthetic particles (e.g. polyvinyl alcohol) that are often used to occlude small vascular branches, e.g. in vascular tumors, cannot be localized in the x-ray image.

Object:

To enable synthetic particles (embolise) to be visualized in the x-ray image by the admixture of radiodense substances, e.g. iodine.

Advantages:

With the invention, synthetic particles are rendered visible in the radiographic image and control of placement is ensured. This simplifies and increases the safety of angiographic embolization.

Embodiment example:

1. Mixing a vinyl alcohol monomer solution with iodine-containing contrast agent in a concentration of 100 mg I/cm³
2. Polymerization
3. Comminuting the synthetic substance (milling)
4. Producing a quantity of particles of equal size (100, 250, 500, 1000 µm)

Protective Claim:

1. Particles for vascular embolization
characterized in that
they are doped with radiodense substances.